



## ARL is an Authority on Nutrition and the Science of Balancing Body Chemistry Through Hair Tissue Mineral Analysis!

Hair Tissue Mineral Analysis


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# Calcium

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## Calcium

Calcium is the most plentiful element in the body, concentrated mostly within the bones, teeth and nerves. Calcium helps regulate cell permeability, acid-base balance, hormone secretion, cell division and osmotic balance. [Osmotic balance ensures that optimal concentrations of electrolytes and non-electrolytes are maintained in cells, body tissues, and in interstitial fluid.] It stabilizes cell membranes, helps muscles relax and slows nerve transmission and the heart rate. Calcium helps prevent fluid loss from cells and from the blood.

Calcium inhibits thyroid-releasing hormones and increases insulin secretion. It inhibits the sympathetic nervous system. It is required for phosphorus metabolism and energy production in the Krebs cycle.

Calcium is also important as a detoxifier, preventing the uptake of lead and cadmium. Blood clotting and fat digestion depend on calcium. Calcium is extremely alkaline-forming and helps maintain the pH balance of the blood.

Stability, hardness and physicality are qualities of calcium.

## Symptoms Of Calcium Imbalance

Deficiency symptoms may include osteoporosis, rickets, non-union of fractures, tooth decay and insomnia. Teeth, fingers and other bones may be misshapen. Posture can be poor and legs bowed. Other symptoms are muscle cramps, muscle spasms, irritability, hyperkinesis, hyperacidity, bruising, high blood pressure, fight-or-flight reactions, fast oxidation, lead and cadmium toxicity. Calcium toxicity symptoms may include fatigue, depression, defensiveness, muscle weakness, pain, arteriosclerosis, arthritis, kidney stones and gallstones. Additional symptoms include bone spurs, rigidity, slow metabolism, constipation, social withdrawal and spondylitis (rigidity and inflammation of the spine).

In many instances, calcium is *biounavailable*. This means it is present, but cannot be used properly. This condition causes symptoms of deficiency and excess at the same time.

## Dietary Sources Of Calcium

Excellent calcium foods include raw, certified milk, cheese and yogurt, sardines, caviar, cod roe, gelatin, smelt and egg yolks. Soups made with bones such as a ham hock or veal joint broth are also excellent sources.

The next best sources are kelp, brewer's yeast and other sea vegetables. Other good sources are almonds, sesame seeds, beans and filberts. Dark green vegetables such as kale, collard greens, mustard greens, turnip greens, comfrey and carrots are also good.

Corn tortillas or corn chips prepared in the traditional way with lime are other good sources. However, most corn chips do not contain lime and are not a good source of calcium. Neither is corn bread or corn eaten as a vegetable.

## Calcium Supplements

Other excellent supplements are calcium citrate, calcium chelate and calcium gluconate. Bone meal used to be popular and is a superb supplement if it is not contaminated with lead. Microcrystalline hydroxy apatite crystals (MCHC) is another excellent form of calcium. Other forms are calcium lactate, orotate and aspartate.

Calcium carbonate, phosphate, dicalcium phosphate and tricalcium phosphate are not well absorbed as the phosphorus binds tightly to the calcium. Calcium carbonate is common chalk. It is extremely alkaline and found in Tums, other anti-acids and coral calcium. People who are too acidic may benefit from it. Unfortunately, stomach acid is important for digestion and reducing it too much interferes with digestion.

Many commercial calcium preparations in drug stores also contain lots of sugar. Some are even sold like candies. These products will be less effective because sugar upsets calcium metabolism. Usually the calcium is in the form of calcium carbonate, a poorly absorbed form. It is best to avoid calcium carbonate, coral calcium and sugared calcium supplements.

## Calcium And The Fight-or-flight Response

In the fight-or-flight response, the body excretes calcium in the urine. This causes the muscles and nervous system to go into a state of alertness to respond to stress. Those who live in a fight-or-flight pattern much of the time are continuously losing calcium in their urine. These *sympathetic dominant* individuals overuse their sympathetic nervous system.

In the exhaustion stage of stress, calcium is lost into the tissues. Low tissue sodium and potassium levels prevent calcium from remaining in an ionized or soluble form in the blood. Instead, it precipitates and deposits in many body tissues including the joints, arteries, kidneys and elsewhere. This is a cardinal sign of aging.

## Calcium Synergists

*Copper* is required to fix calcium in the bones and helps raise the tissue calcium level. Many people have biologically unavailable copper which causes their calcium problems. In fast oxidizers, copper deficiency contributes to a calcium deficiency.

*Iodine* is required for thyroid activity. Low thyroid activity is associated with biounavailable calcium and calcium deposition in the soft tissues. The best sources of iodine are fish and sea vegetables like kelp or dulse. Iodized salt is not as good a source. *Boron* apparently improves adrenal gland activity which makes copper more available. Boron is found in nuts, beans, leafy greens and bone extracts.

*Vitamins A and D* are important for calcium utilization and are commonly deficient. Vitamin D is only found in enriched milk, fish oils and from sun exposure. Vitamin A is only found in fish oils and meats. Beta carotene must be converted to vitamin A. Low thyroid activity impairs the conversion. Vitamin A should be recommended before beta carotene.

*Magnesium* helps keep calcium in solution. Sources of magnesium include nuts, seeds, kelp, wheat bran, wheat germ, molasses and brewer's yeast. *Silica* is another calcium synergist. It may be transmuted into calcium according to Dr. Louis Kervan, author of *Biological Transmutations*. *Chlorine, hydrochloric acid* in the stomach and *adequate protein* in the diet are also required for calcium utilization.

Adequate *adrenal hormone* levels are also essential for proper calcium metabolism. *Infrared light* is also extremely beneficial for calcium metabolism.

## Calcium Antagonists

*Sugar* upsets the calcium/phosphorus ratio in the blood more than any other single factor, according to researcher Dr. Melvin Page. It also stresses the adrenal glands and upsets the hormone balance which affects calcium metabolism.

*Lead* and *cadmium* antagonize and replace calcium in the bones and elsewhere. Hidden lead toxicity, for example, is an important cause of weak bones and osteoporosis. Tests for toxic metals may not reveal it when it is deeply embedded within the bones. A hair analysis may reveal it later as it comes out of the body through the hair and other routes.

*Fluoride* replaces calcium in the bones, causing them to become brittle and weak. Sources are fluoridated tap water, some mineral waters, foods contaminated with fluorides from the soil and foods processed with fluoridated water like reconstituted fruit juices and soda pop.

*Excess phosphorus* binds calcium and impairs its absorption from the intestines. Sources are soda pop and diets very high in animal protein. *Phytates* found in high grain diets, soy and other beans bind calcium preventing its absorption. *Excessive oxalic acid* found in spinach, cranberries, rhubarb and tea can interfere with calcium utilization. *Low stomach acid* and *low protein diets* impair calcium utilization.

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